



# Gender Differences in the Intergenerational Transmission Process of Educational Aspirations in Late Childhood

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## Abstract

Parents' aspirations for their children's future educational attainment influence their child's educational aspirations. However, gender differences in the intergenerational transmission of educational aspirations have not been fully explored. The present study employed a two-step model of value transmission to provide a detailed picture of the gender patterns that occur during the transmission process of educational aspirations in late childhood. A total of 2857 Chinese students ( $M_{\text{age}} = 9.85$  years,  $SD = .37$ , range = 8–12; 1373 girls) and their parents were followed from fourth to sixth grade. Fathers and mothers separately reported their educational aspirations for their children, and children reported their perceptions of their fathers' and mothers' educational aspirations for them as well as their own educational aspirations. The results indicate that different patterns for girls and boys emerged at each step of the transmission process. Specifically, in the perception step, girls exhibited more accurate perceptions of maternal educational aspirations than boys did, but this was not true of their perceptions of paternal educational aspirations. Furthermore, in the acceptance step, both boys and girls revealed higher levels of acceptance of their perceived same-sex parent's educational aspirations. Our study provides a framework for analyzing and understanding gender patterns in the intergenerational transmission of values.

**Keywords** Gender differences · Intergenerational transmission · Educational aspirations · Two-step process model · Late childhood · Chinese cultural groups

Students' educational aspirations are strong predictors of their grades, academic achievements, and ultimate educational attainment (Jacob and Wilder 2011; Zhang et al. 2011). Therefore, many psychologists and educationalists have attempted to identify the determinants of students' educational aspirations. Based on the expectancy-value theory of achievement motivation (Wigfield and Eccles 2000), children's expectations for success are influenced by the beliefs of their parents (i.e., parental expectations of their child's future). Parents' educational aspirations for their children can function as a form of

communication, which conveys to children the value that society and parents place on education outcomes and thereby shapes children's educational aspirations (Yamamoto and Holloway 2010).

Numerous studies have provided compelling evidence of the positive influence of parents' educational aspirations on their child's educational aspirations (Kirk et al. 2011; Lazarides et al. 2016; Zhang et al. 2011), and some studies also have examined the mechanisms of the intergenerational transmission of educational aspirations (Wu et al. 2018). However, whether there are gender differences during the transmission process of educational aspirations remains unclear. The theories and research on gender differences in socialization indicate that boys and girls are socialized differently (Carter 2014) and that fathers and mothers play different roles in the development of their children (Maccoby 1992; Parke 2002; Pruett 1995; Steinberg 2001). Therefore, the present study aims to identify parent and child gender differences in the process of intergenerational transmission of educational aspirations.

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## Intergenerational Transmission of Educational Aspirations

Educational aspirations refer to the desired levels of future educational attainment (Portes and Rumbaut 2005; Yamamoto and Holloway 2010). Because they are relatively independent of reality and experience, educational aspirations are more likely to be shaped through socialization (Yamamoto and Holloway 2010). The transmission of educational aspirations from parent to child, however, is not an automatic copying process whereby the parent expresses his or her values and the child passively accepts these values as given (Barni et al. 2011). Rather, intergenerational transmission also depends on the child's construction (Gniewosz and Noack 2012; Zentner and Renaud 2007).

Grusec and Goodnow (1994) proposed a two-step model of value transmission that emphasizes the active roles of both the parents and the child. First, children develop either an accurate or an inaccurate perception of their parents' values, and second, children either accept or reject the values that they perceive. That is, the relationship between parents' and children's values is mediated by the child's perceptions of their parents' values. The assumptions of this theory have important implications for understanding the underlying mechanism of the transmission of values and have been supported by a number of studies on the intergenerational transmission of various types of values (Barni et al. 2011; Knafo and Schwartz 2009; Okagaki and Bevis 1999; Zentner and Renaud 2007). To the best of our knowledge, only one study has applied the two-step model to explore the transmission process of educational aspirations. Wu et al. (2018) concluded that Chinese parents' educational aspirations are positively related to adolescents' perceptions of their parents' educational aspirations, which, in turn, are predictive of the adolescents' own educational aspirations 6 months later.

## Gender Differences in the Transmission Process

During the socialization process of children, fathers and mothers influence their sons and daughters differently (Bem 1985), and accordingly, both the parents' gender and the child's gender may affect the intergenerational transmission of educational aspirations. Based on Grusec and Goodnow's (1994) two-step model, gender differences may emerge in the extent to which children accurately perceive their parents' aspirations (the perception step), in the extent to which children accept their perceived parents' aspirations (the acceptance step), or in both steps; additionally, these gender patterns are likely to be distinct between the two steps. However, a majority of existing studies focus on the gender differences in the direct association between parents' and children's

educational aspirations (Jodl et al. 2001; Lazarides et al. 2016; Rimkute et al. 2012; Rosen and Aneshensel 1978; Trusty 2002; Trusty and Pirtle 1998; Zhang et al. 2011) rather than on the gender differences at each step of the transmission process. To the best of our knowledge, no study has yet examined gender differences in the perception step of the transmission of educational aspirations. Furthermore, only two known studies have examined parent gender differences in the acceptance step of the transmission of educational aspirations, and neither of these studies considered the child's gender (Smith 1981, 1991). Moreover, no known study has comprehensively examined parent and child gender differences in the framework of considering the full two-step transmission process. Despite the lack of relevant empirical research, several theoretical views provide insight into this process.

Regarding gender differences at the perception step of value transmission, in which children perceive their parents' values either accurately or inaccurately, there are three primary perspectives. The first perspective, *the child cognition view*, suggests that girls exhibit stronger verbal comprehension ability (Sax 2006) and better social perspective understanding than their male counterparts (Van der Graaff et al. 2014; Walker 2005) and that these strengths can help girls capture and understand the values of their parents. According to this theoretical view, girls should exhibit more accurate perceptions of their parents' educational aspirations than boys. The second perspective, *the parent involvement view*, suggests that because mothers are usually more involved than fathers in the care and supervision of their children (Geary 2000; Lamb 2004), children have greater access to the values of their mothers than to the values of their fathers. According to this theoretical view, children should have more accurate perceptions of their mothers' educational aspirations than of their fathers' educational aspirations. The third perspective, *the same-sex role view*, is founded on social learning theory (Bandura 1969; Bussey and Bandura 1999) and on the gender role model (Acock and Bengtson 1978), which posits that children are more likely to adopt their same-sex parent as a model. Therefore, they may pay more attention to the values and behaviors of the same-sex parent. According to this theoretical view, children's perceptions of parents' educational aspirations should be more accurate within same-sex dyads as opposed to cross-sex dyads.

Regarding gender differences at the acceptance step of value transmission, in which children accept or reject the values that they perceive, there are also three primary perspectives. The first perspective, *the child socialization view*, suggests that during the process of socialization, parents encourage their daughters to be dependent and obedient, whereas parents of sons encourage them to be independent and autonomous (Lewis 1986). Thus, in contrast to boys, girls tend to remain dependent on intimate others (Cross and Madson 1997; Leaper 2002). According to this theoretical view, girls are

more likely to accept their parents' educational aspirations. The second perspective, *the parent identity view*, includes two conflicting possibilities. The first position argues that fathers are generally the head of the family and are thus more responsible for the socialization of their children (Lamb 2004; Paquette 2004). As a consequence, children are more inclined to give greater credence to the views of their fathers as they form their own values, and accordingly, children are more likely to accept and adopt as their own the perceived educational aspirations of their fathers rather than of their mothers. The second possibility suggests that children value more the educational views of their mothers given that it is the mothers who generally assume responsibility for the education of their children (Milliken 2001). Accordingly, children are more likely to accept the perceived educational aspirations of their mothers than of their fathers. The results of the only known studies that have examined parental gender differences at the acceptance step support the second option (Smith 1981, 1991). The third perspective, *the same-sex role view*, argues that because children typically adopt the same-sex parent as their model, they are also more inclined to adopt the values of this parent. According to this theoretical view, children's acceptance of their perceived parents' educational aspirations is higher among same-sex dyads than among cross-sex dyads.

The above theoretical views and their related hypotheses are summarized in Table 1. It can be seen that these hypotheses are incompatible with, yet are not completely independent from, one another. Thus, research regarding parent and child gender differences in the intergenerational transmission process of educational aspirations is necessary. Moreover, the findings of such research may provide a new framework of gender patterns in value transmission.

## Parenting in Chinese Culture

Parenting in China is deeply influenced by Confucianism, which advocates the importance of education, collectivism,

and family obligation (Fulgini et al. 1999; Ho 1986; Huang and Gove 2015). Chinese culture emphasizes the responsibility of parents for governing and teaching children (Ho 1986), which is reflected in the Chinese saying “yang bu jiao, fu zhi guo” [It is the parents' fault if they only feed children without educating them]. Accordingly, Chinese parents more frequently adopt a parenting style called “guan” [training], which involves high levels of both control and warmth as well as adherence to socially desirable cultural norms (Chao 1994; Chao and Tseng 2002). Children's performance, especially academic performance, is regarded as the “report card” of parents and is highly related to the social evaluation of parents and parents' own self-worth (Ng et al. 2014). Furthermore, a common belief in Chinese culture is “yang er fang lao” [raising children for old age], which means that parents need to rely on their children when they become old (Chen 1996; Rubinstein 1987). Because children's educational attainment is strongly associated with the family's economic future, when children's prospects are better, the level of their parents' life quality in old age will be higher (Wang et al. 2019). Therefore, Chinese parents usually have high aspirations about their children's education and get deeply involved in their children's learning; moreover, they make their children aware of the importance of learning and family responsibilities (Chen et al. 1996; Hao and Bonstead-Bruns 1998).

In addition, in traditional Chinese culture, the father is regarded as “yi jia zhi zhu” [the master of the family], who is given superior status to the mother, and he controls the family's financial resources, makes important decisions about the family, and takes care of matters outside the family (whereas the mother is in charge of matters inside the family) (Chuang and Su 2008; Li et al. 2020). Even in modern Chinese societies, such gender differences in family roles still exist, with 82.0% of heads of household and 56.3% of current employees being men (National Bureau of Statistics of China 2016, 2018). Therefore, in most Chinese families, fathers spend more time on work and less time on caring and

**Table 1** Theoretical views and their hypotheses regarding gender differences in the transmission process of educational aspirations

Theoretical views	Hypotheses					
	At the perception step			At the acceptance step		
Child cognition view	Boy < Girl			–		
Parent involvement view	Father < Mother			–		
Child socialization view	–			Boy < Girl		
Parent identity view	–			Father > Mother or Father < Mother		
Same-sex role view	Father-Boy	>	Father-Girl	Father-Boy	>	Father-Girl
	Mother-Girl		Mother-Boy	Mother-Girl		Mother-Boy

educating their children than mothers spend (Mu and Xie 2016; National Bureau of Statistics of China 2019).

Furthermore, traditional gender ideology also emphasizes differences in parenting characteristics between fathers and mothers, as a Chinese popular saying goes, “yan fu ci mu” [strict father, kind mother]. Fathers are traditionally assigned the responsibility for children’s discipline and morality, whereas mothers are responsible for nurturing and protecting their children; accordingly, fathers are more likely to be authoritarian and emotionally distant than mothers (Chao and Tseng 2002; Ho 1987). However, because of the transformations of the social culture in China, the difference in authoritarian parenting is gradually becoming blurred and unstable (Chang et al. 2011; Chen et al. 2017; Shek 2005).

## The Present Study

Late childhood is a sensitive phase for the formation and development of educational aspirations (Muenks et al. 2018; Simpkins et al. 2015). It has been found that fourth graders have clear aspirations about their futures in education (e.g., primary school or below, secondary school, college, etc.; Elliott et al. 2010; Guo 2014; Kandel and Kao 2001) and that such aspirations positively predict later educational aspirations in adolescence (Zhang 2016). Meanwhile, given that parents are still the main agents of socialization and their relationships with their children are relatively conflict-free in late childhood compared to adolescence (Collins et al. 2002; Shanahan et al. 2007), late childhood is also a critical period in which parents are central influences in shaping children’s values.

Therefore, based on Grusec and Goodnow’s (1994) two-step model, in the present study we aim to examine parent and child gender differences in the intergenerational transmission process of educational aspirations during late childhood. Specifically, we focus on examining (a) how children’s perceptions of parents’ educational aspirations for them (the perception step), which is indicated by the extent to which children’s perceived parental educational aspirations are related to parents’ educational aspirations, vary by parent and child gender (Research Question 1) and (b) how children’s acceptance of their perceived parental educational aspirations (the acceptance step), which is indicated by the extent to which children’s own educational aspirations are related to their perceived parental educational aspirations, varies by parent and child gender (Research Question 2). In addition, we examine how the direct effects of parents’ educational aspirations on children’s educational aspirations vary by parent and child gender when considering children’s perceptions of parents’ educational aspirations as a mediating process of the transmission of educational aspirations (Research Question 3).

To test these research questions, we include both the father and the mother in one family, and according to the family

systems framework (Cox and Paley 2003), the family is treated as a unit (father, mother, and child) while also considering the interdependence between the father and mother. Given that the transmission from parents to child—that is, the perception step, the acceptance step, and the direct effect—is an integral process, the three research questions cannot be examined separately. Thus, the three research questions were transformed into two questions during data analysis by asking: (a) how the transmission model varies by child gender and (b) how the influences of parents on their child in the transmission model vary by parent gender. In addition, because children’s perceptions and acceptance of their parents’ values are not instilled overnight, a longitudinal study is necessary to represent the transmission process and causal relationship between parents’ and children’s aspirations. Therefore, we use a three-wave longitudinal design in which a relatively large sample ( $n = 2857$ ) of intact families in China was followed from their child’s fourth to sixth grade. We did not propose specific hypotheses on gender differences given the inconsistencies across theoretical views and the lack of previous research on gender patterns in the transmission process of educational aspirations.

## Method

### Participants and Procedure

The data came from a subproject of the Child Academic and Psychological Development Study (CAPS; Jiang et al. 2019; Lv et al. 2018, 2019a, b, c, 2020; Wang et al. 2020), which is an ongoing longitudinal study designed to investigate the determinants of child academic and psychological development from childhood to adolescence. The participants of this subproject were recruited from 36 primary schools based on the recommendation of the local district school board in a county in Hebei Province, a medium-sized, relatively poor district in eastern China (for details on data collection, see also Jiang et al. 2019; Lv et al. 2019a). All fourth-grade students and their families participated in the subproject in the middle of the Fall semester, and a follow-up survey was administered every half year. At each wave of data collection, the children completed the questionnaires in their classrooms, and the parents completed the questionnaires at home and returned them to school the next day. The fathers and mothers were asked to complete the questionnaires individually and without discussion. The present study was approved by the Institutional Review Board of the Collaborative Innovation Center of Assessment toward Basic Education Quality, Beijing Normal University prior to data collection. Written informed consent to participate in the study was obtained from one parent of each child.

The data for the present study were collected in three waves: Wave 1 (November 2016), Wave 3 (November 2017), and Wave 5 (November 2018). A majority of the 3926 families

who participated in the first wave also participated in the third wave (3799, 96.8%) and the fifth wave (3650, 93.0%). Single-parent families ( $n = 77$ ) and families in which children were not living with both parents ( $n = 716$ ) were eliminated because the intergenerational transmission process in these families was not considered to be comparable to the others. Thus, the final sample for the present study includes 2857 parents-child dyads who participated in all three waves. There is some sample overlap between the present study and the studies of Jiang et al. (2019) and Lv et al. (2019a).

A total of 1373 (48.1%) children were female. The average age at Wave 1 was 9.85 years ( $SD = .37$ , range = 8–12) for children, 36.82 years ( $SD = 4.22$ , range = 25–61) for fathers, and 35.98 years ( $SD = 4.32$ , range = 22–53) for mothers. No significant differences regarding child gender, family income or parent education were found between the families who did and did not participate in all three waves. However, the families who were excluded exhibited significantly lower levels than the included families with respect to family income,  $t(3797) = 6.55$ ,  $p < .001$ ,  $d = .22$ , fathers' education,  $t(3797) = 3.39$ ,  $p < .001$ ,  $d = .11$ , and mothers' education,  $t(3797) = 5.08$ ,  $p < .001$ ,  $d = .16$ , although the effect sizes were relatively small.

Of the 2857 parents-child dyads, 153 (5.4%) had missing data on the father's report in Wave 1, 49 (1.7%) had missing data on the mother's report in Wave 1, 20 (.7%) had missing data on the child's report in Wave 3, and 149 (5.2%) had missing data on the child's report in Wave 5. Little's (1988) Missing Completely at Random test revealed that the data were missing at random,  $\chi^2(42) = 34.58$ ,  $p = .785$ .

## Measures

### Educational Aspirations

Fathers and mothers reported their educational aspirations for their children in Wave 1 ("How far in school do you hope that your child will go?"), children reported their perceptions of paternal and maternal educational aspirations in Wave 3 ("How far in school do you think your father/mother hope for you to go?"), and children reported their own educational aspirations in Waves 1 and 5 ("How far in school do you hope that you will go?"). The same 6-point response scale based on the Chinese educational system (1 = primary school or below, 2 = lower secondary school, 3 = upper secondary school, 4 = junior college degree, 5 = bachelor's degree, and 6 = master's degree or above) was used in all three waves.

### Demographic Variables

Data on child characteristics (i.e., age and gender) and family characteristics (i.e., family structure, father's and mother's ages, and father's and mother's education) were collected from the parent surveys in Wave 1.

## Analysis Plan

SPSS version 19 was used for preliminary analyses, and Mplus version 7.11 was used to conduct structural equation modeling (SEM) with Full Information Maximum Likelihood (FIML) to handle missing data (Muthén and Muthén 2012). Despite the hierarchical nature of the data, where students were nested within schools, the intraclass correlation coefficients (ICC) for children's educational aspirations in Waves 1 and 5 were .019 and .022, respectively, which is a finding that did not support the use of a multilevel model ( $ICC > .05$ ).

First, the transmission model was conducted separately for boys' and girls' families, in which children's perceptions of paternal and maternal educational aspirations in Wave 3 were proposed as mediators between the paternal and maternal educational aspirations in Wave 1 and the children's educational aspirations in Wave 5. Children's educational aspirations in Wave 1 and fathers' and mothers' levels of education were included in this model as control variables.

Then, to investigate whether the transmission model differs by child gender, we employed a multiple-group comparison method. A model that constrained all paths to be equal between boys' and girls' families was compared with an unconstrained model that allowed them to differ. A significant change in the Chi-square statistic indicates that the models are not equivalent for boys and girls. Then, to determine which path was different, we constrained one path at a time and compared it to the unconstrained model's Chi-square with one degree of freedom.

Finally, to investigate whether the influences of the father and the mother on the child differed within a family, we employed the nested-model comparison method. The analysis was performed separately for boys' and girls' families. We constrained one pair of paths at a time, and the constrained model, in which the path of the father's influence was set to be equal to the corresponding path of the mother's influence, was compared with the unconstrained model in which the paths were freely estimated. A significant change in the Chi-square statistic indicates that the influence of the father is not equivalent to the influence of the mother. The model fit was evaluated by using several fit indices, including the Chi-square statistic, comparative fit index (CFI), Tucker-Lewis index (TLI), and root mean squared error of approximation (RMSEA). Acceptable model fit was defined by a CFI and TLI above .90 and a RMSEA less than .08 (Kline 2010).

## Results

### Preliminary Analyses

The means and standard deviations of all study variables and the correlations between the study variables are presented separately for boys and girls in Table 2. On average, children aspired to

**Table 2** Descriptive statistics and correlations among study variables by children's gender

Variables	Boys <i>M (SD)</i>	Girls <i>M (SD)</i>	Correlations							
			1	2	3	4	5	6	7	8
1. Father's education	2.15 (.81)	2.19 (.84)	–	.63***	.14***	.12***	.12***	.08**	.13***	.11***
2. Mother's education	2.14 (.89)	2.18 (.88)	.61***	–	.17***	.18***	.12***	.14***	.14***	.13***
3. Paternal educational aspirations-Wave 1	5.16 (.94)	5.23 (.87)	.16***	.14***	–	.58***	.27***	.26***	.29***	.28***
4. Maternal educational aspirations-Wave 1	5.21 (.89)	5.19 (.87)	.21***	.17***	.61***	–	.33***	.36***	.33***	.35***
5. Children's perceptions of paternal educational aspirations-Wave 3	5.06 (1.11)	5.18 (.96)	.19***	.16***	.29***	.29***	–	.77***	.35***	.47***
6. Children's perceptions of maternal educational aspirations-Wave 3	5.13 (1.08)	5.19 (.95)	.18***	.19***	.30***	.29***	.80***	–	.34***	.50***
7. Children's educational aspirations-Wave 1	4.98 (1.29)	5.10 (1.12)	.19***	.17***	.33***	.32***	.39***	.38***	–	.40***
8. Children's educational aspirations-Wave 5	5.23 (1.02)	5.34 (.94)	.20***	.20***	.27***	.29***	.48***	.45***	.42***	–

Correlations for girls are above the diagonal of the correlation matrix; for boys, below the diagonal. Wave 1 (November 2016,  $M_{\text{child age}} = 9.85$ ); Wave 3 (November 2017,  $M_{\text{child age}} = 10.85$ ); Wave 5 (November 2018,  $M_{\text{child age}} = 11.85$ )

\*\* $p < .01$ . \*\*\* $p < .001$

obtain a bachelor's degree, which was approximately equivalent to their parents' educational aspirations for them and children's perceptions of their parents' educational aspirations. A series of paired-sample *t*-tests revealed that fathers' educational aspirations for their children were significantly much higher than their own education levels for both boys,  $t(1402) = 98.18$ ,  $p < .001$ ,  $d = 5.24$ , and girls,  $t(1300) = 97.36$ ,  $p < .001$ ,  $d = 5.40$ . Similarly, mothers' educational aspirations for their children were significantly much higher than their own education levels for both boys,  $t(1454) = 101.73$ ,  $p < .001$ ,  $d = 5.33$ , and girls,  $t(1352) = 98.90$ ,  $p < .001$ ,  $d = 5.38$ . In addition, paired-sample *t*-tests also revealed that there was no significant difference between fathers' and mothers' educational aspirations for their children for both boys,  $t(1381) = 1.93$ ,  $p = .054$ ,  $d = .10$ , and girls,  $t(1283) = 1.39$ ,  $p = .166$ ,  $d = .08$ .

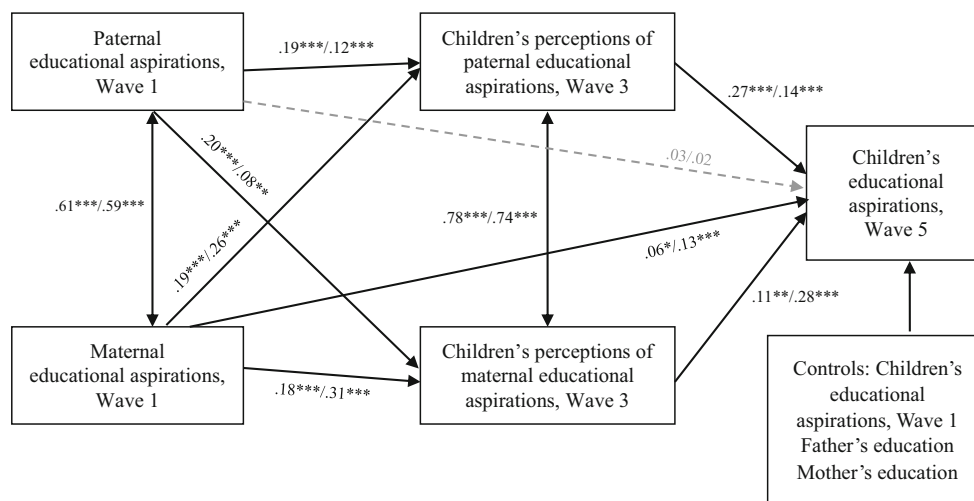
The correlation analysis results indicated that for both boys and girls, paternal and maternal educational aspirations at Wave 1 were positively correlated with children's perceptions of paternal and maternal educational aspirations at Wave 3 and children's own educational aspirations at both Wave 1 and Wave 5. The results also showed that children's perceptions of paternal and maternal educational aspirations at Wave 3 were positively correlated with their own educational aspirations at Wave 5. Children's educational aspirations at Wave 1 and Wave 5 were positively correlated with one another. In addition, for both boys and girls, the father's and mother's education were positively correlated with all other variables on educational aspirations. The correlations lend some support to the transmission model and also indicate that higher parents' education is related to higher parents' educational aspirations for their children and higher children's educational aspirations. Thus, parents' education is controlled in the following analyses.

The transmission model was conducted separately for boys' and girls' families, and the SEM results showed that the transmission model fit the data well for both boys,  $\chi^2(4) = 40.36$  (CFI = .99, TLI = .93, RMSEA = .04) and girls,  $\chi^2(4) = 18.91$  (CFI = .99, TLI = .97, RMSEA = .02). As seen in Fig. 1, for both boys and girls, all the paths were positive and significant, except for the direct path from paternal educational aspirations to children's educational aspirations.

### Child Gender Differences in the Transmission Model

A multiple-group comparison was used to test whether the transmission model differs by child gender. The results indicated that the difference between the Chi-square values for the constrained and unconstrained models when comparing boys and girls was significant,  $\Delta\chi^2(8) = 18.98$ ,  $p = .015$ , which suggests that the models are not equivalent for boys and girls. When examining each path separately, four child gender-related differences emerged. As presented in Fig. 1, the path from maternal educational aspirations to children's perceptions of maternal educational aspirations was significantly lower for boys than for girls,  $\Delta\chi^2(1) = 4.74$ ,  $p = .030$ . The path from paternal educational aspirations to children's perceptions of maternal educational aspirations was significantly higher for boys than for girls,  $\Delta\chi^2(1) = 6.94$ ,  $p = .008$ . The path from children's perceptions of paternal educational aspirations to their own educational aspirations was significantly higher for boys than for girls,  $\Delta\chi^2(1) = 7.21$ ,  $p = .007$ . Finally, the path from children's perceptions of maternal educational aspirations to their own educational aspirations was significantly lower for boys than for girls,  $\Delta\chi^2(1) = 8.33$ ,  $p = .004$ .

**Fig. 1** Model testing gender differences in the intergenerational transmission process of educational aspirations. The first standardized coefficient is for boys, and the second standardized coefficient is for girls. Wave 1 (November 2016,  $M_{\text{child age}} = 9.85$ ); Wave 3 (November 2017,  $M_{\text{child age}} = 10.85$ ); Wave 5 (November 2018,  $M_{\text{child age}} = 11.85$ ). \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$



### Parent Gender Differences in the Transmission Model

A nested-model comparison was used to test whether the influences of the father and the mother on the child differ within a family. Considering that boys and girls differed in the transmission model, the analysis was conducted separately for boys' and girls' families. With respect to boys, the results revealed that only one parent gender-related difference emerged. As presented in Fig. 1, the path from boys' perceptions of paternal educational aspirations to their own educational aspirations was higher than the path from boys' perceptions of maternal educational aspirations to their own educational aspirations,  $\Delta\chi^2(1) = 4.62, p = .032$ .

With respect to girls, the results revealed four parent gender-related differences. As presented in Fig. 1, the path from paternal educational aspirations to girls' perceptions of paternal educational aspirations was lower than the path from maternal educational aspirations to girls' perceptions of maternal educational aspirations,  $\Delta\chi^2(1) = 10.64, p = .001$ . The path from paternal educational aspirations to girls' perceptions of maternal educational aspirations was lower than the path from maternal educational aspirations to girls' perceptions of paternal educational aspirations,  $\Delta\chi^2(1) = 10.92, p = .001$ . The path from girls' perceptions of paternal educational aspirations to their own educational aspirations was lower than the path from girls' perceptions of maternal educational aspirations to their own educational aspirations,  $\Delta\chi^2(1) = 4.31, p = .038$ . Finally, the path from paternal educational aspirations to girls' educational aspirations was lower than the path from maternal educational aspirations to girls' educational aspirations,  $\Delta\chi^2(1) = 4.13, p = .042$ .

### Discussion

The aim of our study was to investigate parent and child gender differences in the intergenerational transmission process

of educational aspirations during late childhood in a relatively large sample of intact Chinese families by using Grusec and Goodnow's two-step model (1994) as a framework. We found that there were gender differences at both the perception step and the acceptance step of transmission, and the gender patterns of the two steps were distinct from one another.

Specifically, at the perception step, children's perceptions of maternal educational aspirations are influenced by maternal educational aspirations more strongly in girls than in boys, and children's perceptions of maternal educational aspirations are influenced by paternal educational aspirations less strongly in girls than in boys. However in the extent to which children's perceptions of paternal educational aspirations are influenced by paternal and by maternal educational aspirations, child gender differences are not significant. Moreover, in girls' families, maternal educational aspirations, relative to paternal educational aspirations, more strongly influence daughters' perceptions of both maternal and paternal educational aspirations; whereas in boys' families, parent gender differences are not significant.

At the acceptance step, children's educational aspirations are influenced by perceived paternal educational aspirations more strongly in boys than in girls, and children's educational aspirations are influenced by perceived maternal educational aspirations more strongly in girls than in boys. Furthermore, in boys' families, perceived paternal educational aspirations, relative to perceived maternal educational aspirations, more strongly influence sons' educational aspirations; however, in girls' families, perceived maternal educational aspirations, relative to perceived paternal educational aspirations, more strongly influence daughters' educational aspirations. In addition, we found that in girls' families, daughters' educational aspirations are directly influenced by maternal educational aspirations more strongly than by paternal educational aspirations.

Regarding gender differences at the perception step of the transmission process of educational aspirations, it seems that none of the three theoretical views was supported. The

observed child gender differences indicate that although girls have more accurate perceptions than boys regarding maternal educational aspirations, this perceptiveness does not hold true for paternal educational aspirations, which is a finding that is not wholly consistent with the hypothesis of the child cognition view. The observed parent gender differences indicate that mothers play a more important role than fathers for girls but not for boys, which is a finding that is not completely consistent with the hypothesis regarding the parent involvement view. In addition, the results do not fully support the hypothesis regarding the same-sex role view.

Actually, each of the three theoretical views has a different area of focus. The parent involvement view emphasizes possible parent gender differences in the availability of parental values; the child cognition view emphasizes possible child gender differences in the ability to capture and understand parental messages; and the same-sex role view emphasizes potential child gender differences in the motivation to attend to paternal or maternal messages. As suggested by Knafo and Schwartz (2003), who investigated what determines children's accuracy in perceiving parental values, perceptual accuracy is dependent on the availability of parental messages and on the children's ability and motivation to attend to the messages. Accordingly, a combination of several theoretical views may be needed to explain such differences in patterns.

One possible explanation for our results is the combination of the parent involvement view and the child cognition view. Because children spend more time with and communicate more frequently with their mothers than with their fathers (Geary 2000; Lamb 2004), mothers' educational aspirations have a greater opportunity to be accessed by both boys and girls than the educational aspirations of their fathers. Meanwhile, because girls are more capable than boys of capturing and understanding parental messages (Sax 2006; Van der Graaff et al. 2014; Walker 2005), girls have more accurate perceptions of parental educational aspirations as long as the messages are accessible. Thus, a mother-girl advantage exists at the perception step.

Another possible explanation is the combination of the parent involvement view and the same-sex role view. That is, boys tend to pay more attention to the values of their fathers, just as girls tend to pay greater attention to the values of their mothers (Acock and Bengtson 1978). Given that mothers' educational aspirations are accessible and girls focus consciously on these messages, a mother-girl advantage is deemed to exist. However, because fathers' educational aspirations are relatively unavailable and inaccessible due to their lesser involvement in the caretaking and education of their children (Geary 2000; Lamb 2004), boys are unable to form accurate perceptions of their fathers' educational aspirations. In addition, the high involvement of mothers in their children's learning, which includes discussing future educational plans with their children, provides opportunities for mothers'

educational aspirations to be subtly perceived by boys, although boys may not intentionally focus on the messages. Therefore, the effect of maternal educational aspirations on boys' perceptions of parents' educational aspirations does not differ from the effect of paternal educational aspirations. Thus, it is concluded that a father-boy advantage does not exist at the perception step.

Although both explanations are likely to be true, the latter explanation fits better with our results. On the one hand, the children in our study were followed for a 2-year period during late childhood (i.e., from approximately age 10 to 12 years), and the basic skills necessary for interpersonal communication, such as the theory of mind understanding and verbal comprehension, are well-developed before the age of 10 (Schneider et al. 2014). Thus, the assumption of the child cognition view that boys are unable to attend to parental educational aspirations may not be valid with respect to children in late childhood. Future research should verify the theoretical view by examining children's perceptual accuracy of their parents' educational aspirations in early childhood or even earlier. If boys, whose cognitive skills are comparable to those of girls, have the same accurate perceptions of their parents' educational aspirations as girls, then the first explanation can be accepted.

On the other hand, our study found that fathers' educational aspirations exhibited a significantly greater influence on perceived maternal educational aspirations for boys than for girls and that mothers' educational aspirations revealed a relatively greater influence, albeit not significantly greater, on perceived paternal educational aspirations for girls than for boys. These results indicate that children may tend to adopt the values of their same-sex parents as standards or references, even when they form the perceptions of the values of their cross-sex parents, which can be explained by the same-sex role view. That is, because children focus more on their same-sex parent, they likely consider the beliefs and behaviors of their same-sex parent to be common values and norms, and accordingly, they may believe that others have the same values as their same-sex parent. However, based on the child cognition view, girls' perceptions of one parent's educational aspirations, whether paternal or maternal, should be less influenced than boys by the other parent's educational aspirations. Of course, future research should further verify the latter explanation by testing whether the father-boy advantage exists in families with highly involved fathers.

Regarding gender differences at the acceptance step of the transmission process of educational aspirations, our results fully support the same-sex role hypothesis. During the socialization process, children learn which beliefs and behaviors are considered to be more appropriate for boys and which are more appropriate for girls by observing and imitating the same-sex people around them, such as parents (Bandura 1969; Bussey and Bandura 1999). Therefore, it is not



surprising that children are more inclined to internalize the perceived educational aspirations of the same-sex parent.

It is also important to note that when considering children's perceptions of parental educational aspirations as a mediating process, maternal educational aspirations still have a direct influence on children's educational aspirations in both boys and girls, whereas paternal educational aspirations do not, and this difference between fathers and mothers is particularly noticeable in girls. Our results indicate that children's perceptions of parental educational aspirations fully mediated the transmission of educational aspirations from father to child but partially mediated the transmission from mother to child. We think that one possible reason is that mothers often also get involved in their children's education activities outside the home, and such involvement may not be known and perceived by children but has an indirect effect on them. For example, because mothers are more likely to attend school events (Baker 2018; Nord and West 2001), mothers' high educational aspirations for their children may promote teachers' expectations for and involvement in the children's education, which thereby increases children's aspirations (Yamamoto and Holloway 2010). However, because the mechanism of how parents' educational aspirations influence their children's educational aspirations in an indirect and imperceptible way was not examined in our study, we cannot give a reasonable explanation for whether such parent gender difference was more marked in girls, which calls for future research to explore the reasons behind the gap.

Our study provides two major contributions to the existing research. First, to the best of our knowledge, our study is the first to explore gender differences in value transmission while considering the specific transmission process, and it provides a new framework for analyzing and understanding gender patterns in value transmission. Our study found that the transmission in both the perception and acceptance steps varied by both parent and child gender, and we concluded that the gender patterns were more complex than any single theoretical perspective can explain. At the perception step, the combination of the parent involvement view and the same-sex role view is supported, and at the acceptance step, the same-sex role view is supported. By combining the two steps, it is evident that children's motivation to observe, follow, and internalize the beliefs and behaviors of the same-sex parent is an important and fundamental internal mechanism that determines the extent to which children attend to and adopt the values of their parents.

Furthermore, parent involvement acts as an external mechanism by which higher levels of involvement promote children's accurate perceptions of parents' values (Gniewosz and Noack 2012; Grusec and Goodnow 1994). Thus, parent gender differences in parental involvement and child gender differences in children's motivation to adopt same-sex parents as models may result in the process of the intergenerational

transmission of values being affected by both the parent's and the child's gender. Based on this reasoning, the results of any previous studies on value transmission that did not consider the parents-child gender dyad or the transmission process must be interpreted with caution or re-confirmed. More importantly, the two-step model must be modified to account for possible gender differences. According to our findings, we propose that in the perception step of value transmission, girls demonstrate more accurate perceptions of the values of their mothers than any other gender combination and that in the acceptance step of value transmission, children exhibit higher levels of acceptance of the values of their same-sex parents than the values of their cross-sex parents. Further studies are required to replicate these findings with respect to other types of values.

Second, our study extends beyond the work of previous studies by considering the interdependence between fathers and mothers. Our study found that the transmission of educational aspirations from one parent to the child was mediated by the child's perceptions of the other parent's educational aspirations. This is consistent with family system theory (Minuchin 1988), which assumes that the interactions in one family relationship (e.g., father-child) are manifested in other family relationships (e.g., mother-child). One explanation for this interdependence is from the perspective of parents. That is, there may be crossover effects where one parent's educational aspirations foster the other parent's involvement in the child's academic activities, and such involvement behaviors, as perceived by the child, may cause the child to conclude that the other parent has high aspirations for him or her (Gniewosz and Noack 2012; Wu et al. 2018). The other explanation is from the perspective of children. When forming perceptions of a family member's values, especially when relevant messages are somewhat inaccessible, children may take the values of other family members as a reference. Similar results were found in other studies that considered the family as a system (Leung and Shek 2014; Rodríguez Ruiz et al. 2019). For example, Leung and Shek (2014) found that paternal aspirations influenced adolescents' positive development via the adolescents' perceptions of maternal control.

### Limitations and Future Research Directions

Some limitations of our study must be noted. First, although we used three waves of longitudinal data to examine the transmission process, it was still difficult to ascertain causal relations. Because the relation between parents' and children's educational aspirations may be reciprocal (Knafo and Schwartz 2009; Zhang et al. 2011), future studies should investigate gender patterns in the influences of children's educational aspirations on their parents' educational aspirations. Second, we considered both paternal and maternal education, which are positively related to both

parents' and children's educational aspirations, to be control variables in our study. However, it is likely that gender patterns in the intergenerational transmission process of educational aspirations may vary by parents' education because parents' education affects their parenting beliefs and behaviors (Xu et al. 2005). Considering that only a few fathers (80, 2.8%) and mothers (99, 3.5%) had tertiary education in our participating families, future studies could examine whether the gender patterns that we found in our study differ in families with highly educated fathers and mothers. Third, the present study focuses on Chinese families, and the role of parents in the socialization of children in Chinese families may differ from the role of parents in other cultures (Chao and Tseng 2002; Hao and Bonstead-Bruns 1998; Keller et al. 2006). Accordingly, future studies should test whether this study's findings can be generalized to other cultures.

### Practice Implications

Our study has important implications for parents and professionals who work with families. Our findings demonstrate that, by comparison, children are more inclined to attend to and adopt the educational aspirations of their same-sex parents. This finding suggests that on the one hand, parents who have the same gender as the child, especially fathers who have sons, should realize that they play a more important role in shaping their children's educational aspirations than their spouses play. On the other hand, cross-sex parents should also actively participate in their children's education and be empathetic and warm toward their children, which can improve children's perceptions and acceptance of their educational aspirations (Grusec and Goodnow 1994; Knafo and Schwartz 2003; Schönflug 2001). Interventions could help make parents aware of the same-sex orientation and encourage both parents to be involved in their children's learning and to have discussions on educational plans with their children.

We also found that both fathers' and mothers' educational aspirations significantly influence their children's educational aspirations and that children's perceptions of one parent's educational aspirations can be influenced by the other parent's educational aspirations. These associations suggest that fathers and mothers should negotiate and reach consensus regarding their children's future educational goals and work together rather than against one another to transmit their shared aspirations to their children. Such consensus between parents can promote their children's internalization of both parents' values (Knafo and Schwartz 2003; Smith 1981, 1991). Interventions could also help to reduce the discrepancy between fathers and mothers in their educational goals for their children.

### Conclusion

Parents' educational aspirations have been identified as important factors in shaping children's educational aspirations. The present study emphasizes parent and child gender differences in the process of the intergenerational transmission of educational aspirations during late childhood. We found evidence that girls have a higher level of accurate perception of maternal educational aspirations and that both girls and boys have a higher level of acceptance of their perceived same-sex parent educational aspirations. Our results suggest that same-sex parents play an important role in children's internalization of educational values, while fathers' insufficient involvement may hinder their children's access to their educational values. Our findings are particularly important in understanding the mechanism and individual differences in the transmission process of educational values, and they highlight that observed gender patterns need to be addressed in future research.

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### Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Ethical Approval** The present study was approved by the Institutional Review Board of the Collaborative Innovation Center of Assessment toward Basic Education Quality, Beijing Normal University.

**Consent to Participate** Written informed consent to participate in the study was obtained from one parent of each child.

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